

FIDALGO BAY AQUATIC RESERVE SITE PROPOSAL APPLICATION

1. GENERAL SITE INFORMATION

A. Site location:

The Fidalgo Bay site is located in northern Puget Sound in northwestern Skagit County. The reserve boundaries extend to the north and west from state route 20 and to the east from March Point Road. The northern boundary extends across Fidalgo Bay from Crandall Spit. The reserve area includes the bedlands and the majority of the tidelands south of the abandoned railroad trestle and only the bedlands north of the trestle and extending north to a line drawn west from Crandall Spit.

B. Site Overview:

1. General site description

The site is a shallow marine bay with expanses of eelgrass. The southern end of the site includes extensive tideflats that transition into salt marsh along the southern and southeastern border of the site (along SR 20). An abandoned railroad trestle is situated across the mid-section of the site. The area of the proposed reserve north of the railroad trestle opens into the northern, deeper water, portion of Fidalgo Bay. The site includes a state waterway, and the area north of the trestle is included in portion of a harbor area.

Most of the tidelands south of the trestle are owned by the state. None of the tidelands north of the trestle are included in the proposed reserve area (see figure 1).

2. Boundaries description (include section, range and township, county)

That portion of the harbor area, waterways and beds of navigable water in Fidalgo Bay owned by the State of Washington located within Section 5, Township 34 North, Range 2 East, W.M. and within Sections 29, 30, and 32 Township 35 North, Range 2 East, W.M. and further described as follows:

That portion of Fidalgo Bay lying southerly of a line beginning at the northeast corner of Tract No. 10 as shown on Plate 11 of the Tide and Shore Lands of Anacortes Harbor as filed by the Tideland Appraisers dated May 1, 1893 and said line extended easterly to terminate at the meander corner between government lots 2 and 3 of Section 29, Township 35 North, Range 2 East, W.M.;

EXCEPTING THEREFROM, that portion of the southerly end of the West Arm of Fidalgo Waterway which was vacated by Waterway Vacation No. 101 according to the Commissioner's Order dated April 29, 1959 for Primary State Highway No. 1 (State Route 20);

ALSO EXCEPTING THEREFROM, that portion of the southerly end of the East Arm of Fidalgo Waterway granted to the Department of Highways as shown on State Road Plat No. 941 dated January 18, 1961 for Primary State Highway No. 1 (State Route 20);

ALSO EXCEPTING THEREFROM, that 100 foot right of way for railroad purposes across said Fidalgo Waterway granted to the Seattle and Montana Railroad Company by decree filed March 2, 1904 according to Condemnation file No. A26;

TOGETHER WITH, those first class tidelands conveyed to the State of Washington according to the Statuary Warranty deed recorded on December 20, 1999 recorded under Auditor's File No. 199912200133, Skagit County Auditor's records and further described as follows:

Tracts 4, 5, 6, 7, 8, 9, and 10 of Plate 13; Tracts 8, 9, 10, 11, 12, 13, 14, and 15 of Plate 12; that portion of Tracts 16 and 17 of said Plate 12 and lying southerly of the Seattle and Montana Railroad Company by decree filed March 2, 1904 according to Condemnation file No. A26; said tracts and plates are according to of the Tide and Shore Lands of Anacortes Harbor as filed by the Tideland Appraisers dated May 1, 1893;

EXCEPTING THEREFROM; that portion of said first class tidelands, if any, conveyed to the State of Washington for Primary State Highway No. 1, Jct. S.S.H. No. 1-D (State Route 20) by deed recorded October 15, 1956 under Skagit County Auditor's file No. 542873; by deed recorded January 3, 1958 under Skagit County Auditor's file No. 560284, and by deed recorded February 7, 1961 under Skagit County Auditor's file No. 603915;

ALSO EXCEPTING THEREFROM, that 100 foot right of way for railroad purposes across said first class tidelands granted to the Seattle and Montana Railroad Company by decree filed March 2, 1904 according to Condemnation file No. A26;

TOGETHER WITH, those second class tide lands conveyed to the State of Washington according to the Statuary Warranty deed recorded on December 20, 1999 recorded under Auditor's File No. 199912200133, Skagit County Auditor's records and further described as follows:

All tide lands of the second class lying between the line of mean high tide and the line of extreme low tide, situate in front of and adjacent to, or abutting government lots 5 and 6, Section 32, Township 35 North, Range 2 East, W.M. and government lot 4, Section 4, Township 34 North, Range 2 East, W.M.;

ALSO TOGETHER WITH, tidelands of the second class, conveyed to the State of Washington according to the Statuary Warranty deed recorded on October 26, 2000 recorded under Auditor's File No. 200010260029, Skagit County Auditor's records and further described as follows:

Tidelands of the second class, extending from mean high tide to extreme low tide as conveyed by the State of Washington in deeds recorded in Volume 88 of Deeds, page 513 on May 21, 1912 and in Volume 102 of Deeds, page 550 on April 25, 1916 of Skagit County Auditor records, situate in front of, adjacent to, or abutting upon that portion of the government meander line described as follows:

Beginning at the northeast corner of Government Lot 1, Section 5, Township 34 North, Range 2 East, W.M.; thence South 28° West, 7.50 chains (495.00 feet); thence South 47° West, 17.50 chains (1155.00 feet) to the terminal point of this description.

Except that portion, if any, lying westerly of the easterly line of "East Arm Fidalgo Waterway" as shown on Plate No. 13, "Tide and Shore Lands in Section 5, Township 34 North, Range 2 East, W.M., Anacortes Harbor" as per the recorded plat thereof on file in the office of the Commissioner of Public lands, Olympia, WA.

ALSO Except that portion conveyed to the State of Washington for Primary State Highway No. 1, Jct. S.S.H. No. 1-D (State Route 20) by deed recorded January 10, 1961 under Skagit County Auditor's file No. 602917.

TOGETHER WITH, those bed lands, if any, lying westerly of the line of extreme low tide fronting and abutting the said second class tidelands situated in front of and adjacent to, or abutting government lots 5 and 6, Section 32, Township 35 North, Range 2 East, W.M. and government lot 4, Section 4, Township 34 North, Range 2 East, W.M.; and lying easterly of said east line of the East Arm of the Fidalgo Waterway;

TOGETHER WITH, those bed lands, if any, lying westerly of the line of extreme low tide fronting and abutting the second class tidelands situated in front of and adjacent to, or abutting government lot 7, Section 32, Township 35 North, Range 2 East, W.M. and lying easterly of the east line of said Fidalgo Waterway and the said east line of the East Arm of Fidalgo Waterway

EXCEPTING THEREFROM, that 100 foot right of way for railroad purposes across said bedlands, if any granted to the Seattle and Montana Railroad Company by decree filed March 2, 1904 according to Condemnation file No. A26;

TOGETHER WITH, second class tidelands and bedlands, if any, lying northerly of the north lateral sideline of said second class tidelands in front of and adjacent to, or abutting government lot 7, Township 35 North, Range 2 East, W.M. and lying southerly of the south line of Tract No. 2 as shown on Plate 12 of the Tide and Shore Lands of Anacortes Harbor as filed by the Tideland Appraisers dated May 1, 1893;

TOGETHER WITH, those bed lands, if any, lying westerly of the line of extreme low tide fronting and abutting the second class tidelands situated in front of and adjacent to, or abutting government lots 2, 3 and 4, Section 29, Township 35 North, Range 2 East, W.M. and the north 10.19 lineal chains along the meander line of government lot 8, Section 32, Township 35 North, Range 2 East, W.M. and lying easterly of the inner harbor line of the easterly most harbor area within Fidalgo Bay as shown on the Map of Anacortes Harbor as filed by the Harbor Line Commission dated 1892;

EXCEPTING THEREFROM; those bedlands, if any, of said Tract 2 as shown on Plate 12 of the Tide and Shore Lands of Anacortes Harbor as filed by the Tideland Appraisers dated May 1, 1893 as conveyed by the State of Washington according to the deed dated April 17, 1908 within Volume 8 of Tide Land Deeds, page 370 on file in the office of the Commissioner of Public Lands;

ALSO EXCEPTING THEREFROM, those bedlands, if any, of Fidalgo Bay lying southerly of said line beginning at the northeast corner of Tract No. 10 as shown on Plate 11 of the Tide and Shore Lands of Anacortes Harbor as filed by the Tideland Appraisers dated May 1, 1893 and said line extended easterly to terminate at the meander corner between government lots 2 and 3 of Section 29, Township 35 North, Range 2 East, W.M.;

ALSO EXCEPTING THEREFROM; tidelands of the first class of said Tract 2 as shown on Plate 12 of the Tide and Shore Lands of Anacortes Harbor as filed by the Tideland Appraisers dated May 1, 1893 as conveyed by the State of Washington according to the deed dated April 17, 1908 within Volume 8 of Tide Land Deeds, page 370 on file in the office of the Commissioner of Public Lands;

All of the above-described lands are situated in Skagit County, Washington. A graphic portrayal of these boundaries is depicted in figure 1.



Figure 1: Proposed Fidalgo Bay site.

3. Current ownership (include detailed ownership map). Identify the intertidal & subtidal areas included in the site

Most of the area south of the trestle is owned by the state with the exception of some non-state owned tidal areas in the south east, southwest and western shoreline and the intertidal areas around the trestle. Only the subtidal area north of the trestle is owned by the state and managed by DNR (see figure 1).

4. Current county shoreline designation and description

Most of the site is within the Anacortes City limits, and all of it is within the Urban Growth Boundaries of Anacortes. The shoreline adjacent to the site is zoned light industrial adjacent to the western and southern boundaries of the site.

Residential development adjacent to the site is limited to 1 unit per 3 acres. Presently, ten single-family residences and the 12-acre Fidalgo Bay RV Resort are located along the western and southwestern shoreline of the site.

The eastern shore adjacent to the site is zoned for heavy manufacturing. Two oil refineries operate in this area. However, the upland area directly adjacent to the eastern shoreline are presently used for hay and pasture and provide a buffer to the refineries.

C. Justification for proposal: (briefly summarize the reason for establishing the aquatic reserve)

The Fidalgo Bay site contains expansive native eelgrass beds, other marine vegetation and tide flats that support spawning and rearing for forage fish, including Pacific herring, surf smelt and sand lance. Migratory waterfowl, blue heron, and raptors such as bald eagles and peregrine falcon also utilize the site for feeding. Puget Sound Chinook salmon, a threatened species under the endangered species act, utilize the reserve area for feeding, refuge, and migration. The reserve also contains oysters, clams and Dungeness crab rearing habitat. In addition, the site is intended to complement the draft restoration plan being developed by the Texaco Spills Natural Resource Trustees and to support the continued management of the conservation easement established by the Skagit Land Trust for South Fidalgo Bay.

Habitat values

Forage fish spawning habitat
Eelgrass
Tideflats
Salt marsh
Important bird foraging area
Migratory waterfowl habitat

Species

Chinook salmon
Migratory waterfowl
Bald eagle
Peregrine falcon
Blue heron
Herring
Sand Lance
Surf smelt

D. The ecological and cultural quality of the site

1. What is the current condition of the site?
 - Is the site degraded?

The site has been modestly degraded by non-native species and habitat alteration/loss at the site. Water quality remains good at the site.

Antrim et al. (2003) identify 13 habitat opportunities (mostly adjacent to the site) for restoration or conservation within the site including five that were identified as ‘high priority.’ High priority projects include restoring Crandall Spit, modifying the city-owned trestle, modifying the trestle berm at Weaverling spit, protecting Weaverling spit north/Stockwell beach and removal of wood debris at the historic Anacortes Plywood Mill.

- Are non-native species found at the site?

Fidalgo Bay and adjacent environs have been colonized by a wide-variety of non-native invertebrates. The variety of species and their abundance have not been rigorously examined but are known to include common non-native species including Pacific oysters, purple varnish clams (*Nuttallia obscurata*), eastern softshell clam (*Mya arenaria*) and the Asian mud snail – *Battilaria attramentaria* (Antrim et al. 2003). *Battilaria* was first detected in Padilla Bay in the 1960’s, however the invasion likely occurred sometime earlier. Today, the Asian mud snail is the most abundant macrofauna on mudflats in both Padilla (PSWQAT 2000) and Fidalgo Bays. Exclusion experiments suggest that *Battilaria* may facilitate the invasions of other non-native species including Asian eelgrass (*Zostera japonica*) and another mud snail (*Nassarius faterculus*) (Wonham et al. 2003).

Spartina, *Sargassum* and *Z. japonica* have all been observed in the vicinity of the site. Of these only *Z. japonica* is expected to be abundant within the reserve.

- Are there water quality concerns associated with the site?

Fidalgo Bay is impaired by Benzo(a)Anthracene and Chrysene. The National Toxic Rule criterion was exceeded in a composite of 50 littleneck clam soft-parts for both pollutants (Johnson 2000). The bay has a history of oil releases and other spills which created an impetus for sediment surveys. While sediments within the bay are poorly characterized, two surveys including a total of 35 sites have found little evidence of significant contamination (Johnson 1997 and Johnson 2000). A monitoring station in northern Fidalgo Bay found all water quality parameters, including fecal coliform, dissolved oxygen and nutrient levels to be within acceptable state standards (Newton et al. 1998).

- Are there signs of habitat loss within the site?

Williams et al. (2003) report that within Fidalgo Bay 45 acres were altered at depth, 47 acres have been filled, 8 acres have been dredged, 8 acres are affected by over-water structures and 5.6 of 8.7 miles of shoreline have been armored. All dredging activity has taken place to the north of the proposed reserve, however tideland filling, shoreline armoring and overwater structures are present throughout the bay (Figures 2 and 3). The biological consequences of these activities are varied and the cumulative impacts are uncertain. However, the loss of eelgrass (*Zostera marina*) and macroalgae habitats within Fidalgo Bay is potentially significant because it may represent the loss of spawning habitat for Pacific herring (Williams et al. 2003). Penttila (1995) identifies historic log-raft storage areas as an additional area where intertidal habitat within the proposed site has been adversely affected. Many log-raft areas were historically vegetated and aquatic vegetation communities in these areas are still recovering.

Oil spills have been noted in the area and may permanently affect some habitats. Following a 200-barrel spill in 1991 a portion of the shoreline along the eastern shoreline of the site was removed to facility the removal of contaminated sediment. This segment of shoreline is documented to support surf smelt spawning and was replenished with clean pea gravel (Penttila 1991). Sediment sampling within the bay has found few impacted areas.

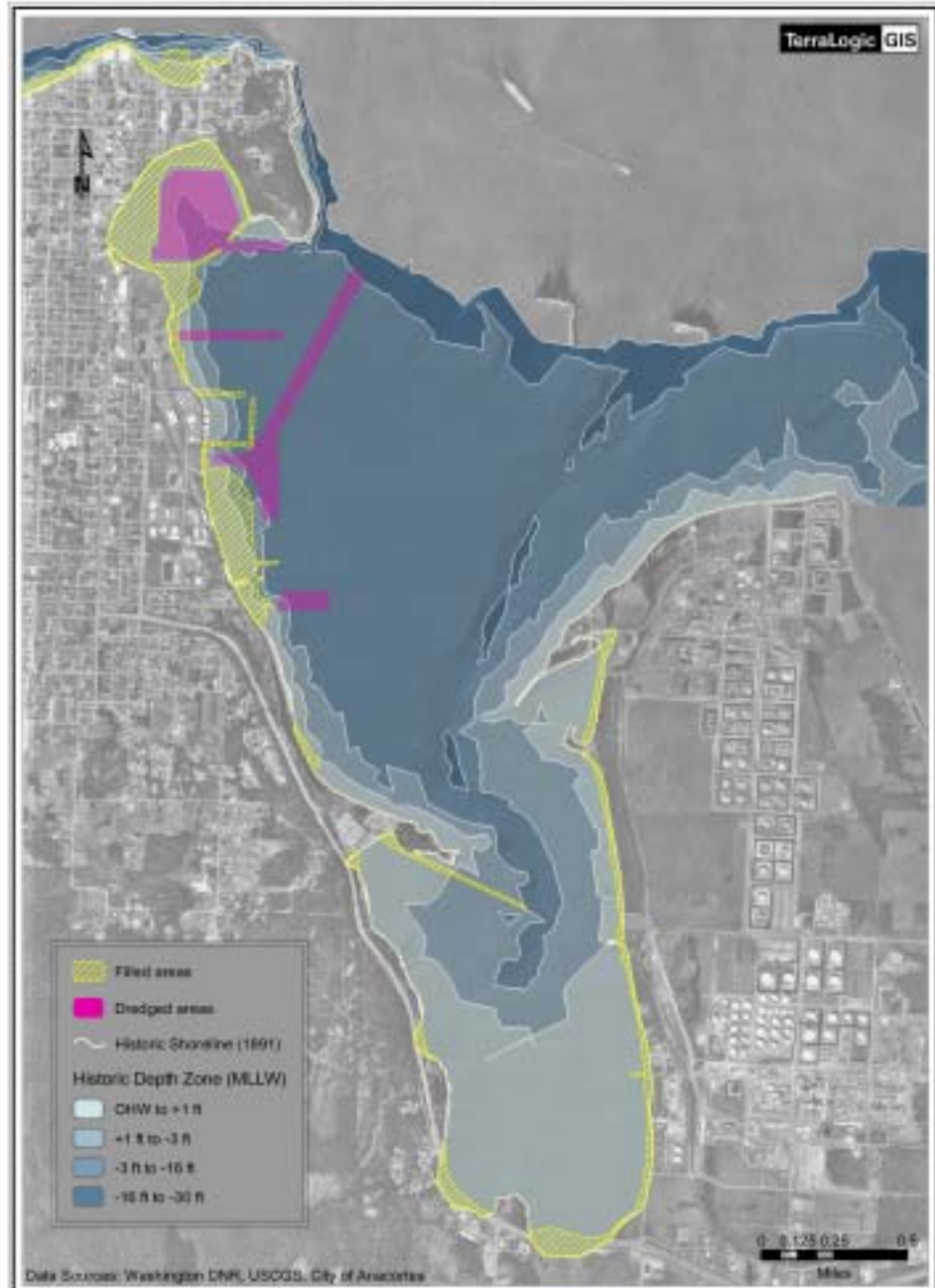


Figure 2: Filled and dredged areas within Fidalgo Bay (from Williams et al. 2003)



Figure 3: Overwater structures in Fidalgo Bay (from Williams et al. 2003)

- Are there signs of habitat loss within the biogeographic region?

Fidalgo Bay is within the Strait of Georgia biogeographic sub-region. Levels of shoreline development in the Strait of Georgia are similar to the average for Puget Sound with 32.6% of the shoreline modified by structures (Berry et al. 2001). Like other parts of Puget Sound, protected bays and river mouths within the Strait of Georgia have been heavily modified by harbor development, flood protection, and commerce. A large sheltered bay, Padilla Bay, to the east of the site is a research reserve. Although this site is highly valued for its current environmental attributes, there is speculation that the development of extensive eelgrass flats in this bay is a recent phenomenon.

- Are ecosystem processes (e.g., freshwater flow, littoral drift, nutrient cycling, etc.) intact?

Available data indicates the bay is well-mixed vertically with temperature, salinity and dissolved oxygen measurements similar to regional values (Antrim et al. 2003). The head of the bay, adjacent to highway 20, has been altered and freshwater inflows are reduced and possibly impacted by fertilizers and herbicides from the golf course on the south side of highway 20. The inner bay (south of the railroad trestle) has likely been significantly affected by the trestle structure and constrained water and sediment flow. Some spits within the bay including Crandall Spit (outside of the proposed site) appear to be sediment starved and there are few remaining natural sources for shoreline sediment within the site.

2. Risks to the ecosystem or feature of interest (If applicable)

- Can threats contributing directly to the area's decline be prevented through reserve establishment?

Numerous developments have been proposed for Fidalgo Bay that would adversely affect the existing marine resources. Prior to the purchase of the southern portion of the bay by the Skagit Land Trust there had been proposals to use the area as an industrial harbor, luxury development, marina and an oyster farm (Bauer 1999). As of 1999 four active development proposals may affect the reserve: Brent Homes, Shipyard Site – plans for a 50-acre site to include a shipyard and industrial re-development, including a proposed access channel; Andrews/Gillespie/Jermyn – plans for the construction of residential units and docks on a 3-acre site that would require in-water work and dredging; Fidalgo Bay Resort – a proposed 18-acre marina; Public Project – pedestrian and possible scenic rail line along south shoreline of Fidalgo Bay and across trestle (City of Anacortes 2000). Anacortes Planning Commission granted a shoreline permit for construction of an approximately 12-foot wide pedestrian train on August 7, 2002. While no development proposals currently exist for the refineries along the eastern shore of the bay, it is likely that upgrades will continue to occur at these facilities. Additionally, roads are immediately adjacent to much of the reserve site and management associated with roads including brush clearing is negatively affecting the reserve.

The presence of refineries adjacent to the reserve represents an ongoing source of concern for natural resources. Vessels carrying oil and oil-derived products berth to the

north of March Point where currents typically flush materials into Guemes Channel. Spills have occurred at these refineries in the past, and are likely to occur in the future, however response plans are in place to prevent severe impacts (Ecology 2003). The response plan describes a booming strategy that effectively partitions the site using the railroad trestle as a booming boundary to block spills. Other areas targeted for booming protection include Crandall and Weaverling Spit (Figure 4). The goal for all booming strategies in Fidalgo Bay is to exclude oil from sensitive areas.



Figure 4: Potential spill sources and booming areas (Ecology 2003).

3. Restoration potential

- Is there pending restoration at the site?

Antrim et al. (2003) identify 13 habitat opportunities for restoration or conservation within Fidalgo Bay including five that were identified as 'high priority.' High priority projects adjacent to the proposed site include restoring Crandall Spit, modifying the city-owned trestle, modifying the trestle berm at Weaverling spit, protecting Weaverling spit north/Stockwell beach and removal of wood debris at the historic Anacortes Plywood Mill. While none of these restoration projects are yet being undertaken this report is intended to inform mitigation and development efforts associated with the Revised Final Fidalgo Bay-Wide EIS (2000) which articulates a vision for Fidalgo Bay that "recognizes the need for growth and economic development and the presence of valuable environmental resources."

An effort is underway to raise the native Olympia oyster (*Ostreola conchaphila*) in Fidalgo Bay. A site on the east side of the reserve under the trestle was planted with oyster seed on April 29th, 2002 (Antrim, 2003). Additionally, funding is being pursued to nourish surf smelt spawning beaches along the north side of March Point (Penttila, personal communication).

Other proposed restoration include:

1. Draft Restoration Plan and Environmental Assessment for the Texaco Oil spill into Fidalgo Bay in 1991 and 1992. The preferred restoration alternative is to acquire from willing sellers, privately owned intertidal properties adjacent to the section of the proposed site north of the trestle.
2. Plan for Habitat Protection, Restoration, and Enhancement in the Fidalgo/Guemes Area – City of Anacortes. Priorities that will positively impact the proposed reserve area include: Removing the dike and creosote-treated logs from Crandall Spit, redesigning the railroad trestle to allow for more tidal flow into the south section of the proposed site and preserving 0.5 miles of surf smelt spawning beach at Weaverling Spit.
3. Skagit County Marine Resources Committee has proposed two restoration/conservation projects for the area: 1. Catalog and map potential project sites to provide guidance for future restoration and conservation projects in Fidalgo Bay; 2. Determine if outfall identified through a recent rapid shoreline inventory along the March Point shoreline of the proposed site are active and pose any water quality threats.

- Would restoration benefits extend beyond site boundaries?

Fidalgo Bay serves as a seasonal nursery and aggregation area for a large number of individuals and species that spend significant portions of their lives elsewhere. Therefore, restoration benefits to Fidalgo Bay are likely to provide local, as well as regional benefits. However, the increases in fitness for some regional or transient populations may be undetectable.

4. Special value for biodiversity or species diversity

- Does the proposed site capture habitat used regularly by species of special conservation interest?

The Fidalgo Technical Committee and the Washington Department of Fish and Wildlife identify Fidalgo Bay as habitat or probable habitat for: Pacific herring (*Clupea pallasii harengus*), Pacific sand lance (*Ammodytes hexapterus*), salmonids (e.g. *Oncorhynchus spp.*), surf smelt (*Hypomesus pretiosus*), bull trout (*Salvelinus confluentus*), English sole (*Parophrys vetulus*), starry flounder (*Plantichthys stellatus*), rock sole (*Lepidopsetta bilineata*), Dungeness crab (*Cancer magister*), butter clam (*Saxidomus giganteus*), Pacific littleneck (*Protothaca staminea*), Manila littleneck (*Tapes philippinarum*), geoduck (*Panope generosa*), black brant (*Branta bernicla nigricans*), great blue heron (*Ardea herodias*), and least sandpiper (*Calidris minutilla*) (Williams et al. 2003). Of these herring are known to spawn annually in the bay and surf smelt have been documented to spawn on shorelines throughout the bay. Additionally, great blue herons are frequent visitors to Fidalgo Bay possibly coming from an active rookery on the southeast side of March Point or other regional nesting areas.

Of particular note is the use of the bay by wintering brants. Recent research suggests brants wintering in this area are primarily wintering Pacific High Arctic (PHA) brants. This recently recognized population of brant nest on the Parry Islands of the Northwest Territories (Canada). The population stages in fall at Izembek Lagoon Alaska. They predominantly winter in Padilla, Samish, and Fidalgo Bays of Washington and near Boundary Bay, British Columbia, although some individuals have been observed as far south as Mexico. Breast and belly plumage of PHA brant are predominantly gray, intermediate between Atlantic brant and Pacific brant, but other color morphs have been captured in molting flocks on breeding areas. The development of a management plan and monitoring program are underway for this newly designated population. Recent estimates suggest the PHA brant population may consist of only 4,000 to 8,000 individuals making it either the “rarest or second rarest goose stock in the world” (Brewer et al 1999). Because the stock has low population size and low annual recruitment, this stock is becoming a major focus of brant management in Washington State. During migration and inter, brant depend on vegetated intertidal habitats of well protected, shallow waters. Seagrasses and green algae are the primary foods of brant in North Puget Sound (Einarsen 1965, Baldwin and Lovvorn 1994). These birds also use nearshore unvegetated areas, such as mud flats, sand/gravel bars, and sandy and rocky beaches to escape the water to rest, preen (Henry 1980), and presumably reduce heat loss (Berry et al. 1999).

- Does the proposed site capture vulnerable habitats, life stages or populations? (Vulnerable habitats, life stages or populations include: seal haul-outs, breeding bird aggregations or rookeries, seasonal bird aggregations, seasonal fish aggregations (feeding or breeding), or fish spawning aggregations)

Descriptions elsewhere in this proposal of the local herring stock and related vegetation apply to this response. In addition, Wahl (1996) reports census counts for a variety of species as observed using systematic census techniques from shore-based observation stations. Fidalgo Bay was one of the areas included in these surveys and significant aggregations are reported in table 2. While populations of many of these species have declined soundwide since these observations (PSWQAT 2002), it is likely that these sites still attract aggregations that exceed those observed in other parts of Puget Sound.

Table 2: Peak abundance observations for aggregations in the vicinity of Fidalgo Bay

Species	Location	Number Observed	Maximum observed (Location)
Red-throated Loon	Fidalgo Bay	45	651 (Drayton Harbor)
Common Loon	Fidalgo Bay	21	142 (Drayton Harbor)
Pied-billed Grebe	Fidalgo Bay	9	17 (Padilla Bay)
Horned Grebe	Fidalgo Bay	136	382 (Drayton Harbor)
Western Grebe	Fidalgo Bay	1,872	26,060 (Bellingham Bay)
Double-crested Cormorant	Fidalgo Bay	286	500 (Bellingham Bay)
Great Blue Heron	Fidalgo Bay	60	731 (Dungeness Spit)
Brant	Fidalgo Bay	2,199	22,931 (Padilla Bay)
Greater Scaup	Fidalgo Bay	559	5,671 (Padilla Bay)
Bufflehead	Fidalgo Bay	1,121	2,497 (Jamestown)
Red-Breasted Merganser	Fidalgo Bay	655	655 (Fidalgo Bay)
Ruddy Duck	Fidalgo Bay	691	3,160 (Lynch Cove)
Ring-billed Gull	Fidalgo Bay	108	563 (Drayton Harbor)
Thayer's Gull	Fidalgo Bay	48	148 (Bellingham)

Historic observations suggest that log booms in the northern parts of Fidalgo Bay were used at all tides by harbor seals (Jeffries et al. 2000). While harbor seals remain common in the vicinity of Fidalgo Bay, harbor seals are no longer observed to haul-out in significant numbers (Antrim et al. 2003).

Penttila (1995) suggests that the bay may concentrate larvae and observes that larval densities are significantly higher in southern Fidalgo Bay than in northern Fidalgo Bay where stronger currents probably distribute larvae more widely. As noted elsewhere, Guemes channel supports large numbers of egg bearing Dungeness crabs and Fidalgo Bay is identified as a rearing area for juvenile Dungeness crab.

5. Ecological processes that sustain the aquatic landscape
 - Would protection of the site protect/maintain ecological processes?

Protection of the site may facilitate the protection and restoration of ecological processes at and surrounding the site.

6. The cultural quality of the site
 - Does the site contain or protect significant cultural resources? (Does the site contain heritage, historical, or cultural resources that are eligible for the Wa. Register of Historic Places, RCW27.34.220 or the National Register of Historic Places? Evaluate the value of those described in the proposal from a regional or statewide basis (ex. sites listed on the state or national historical register or significant historical indigenous use areas would have high values.)

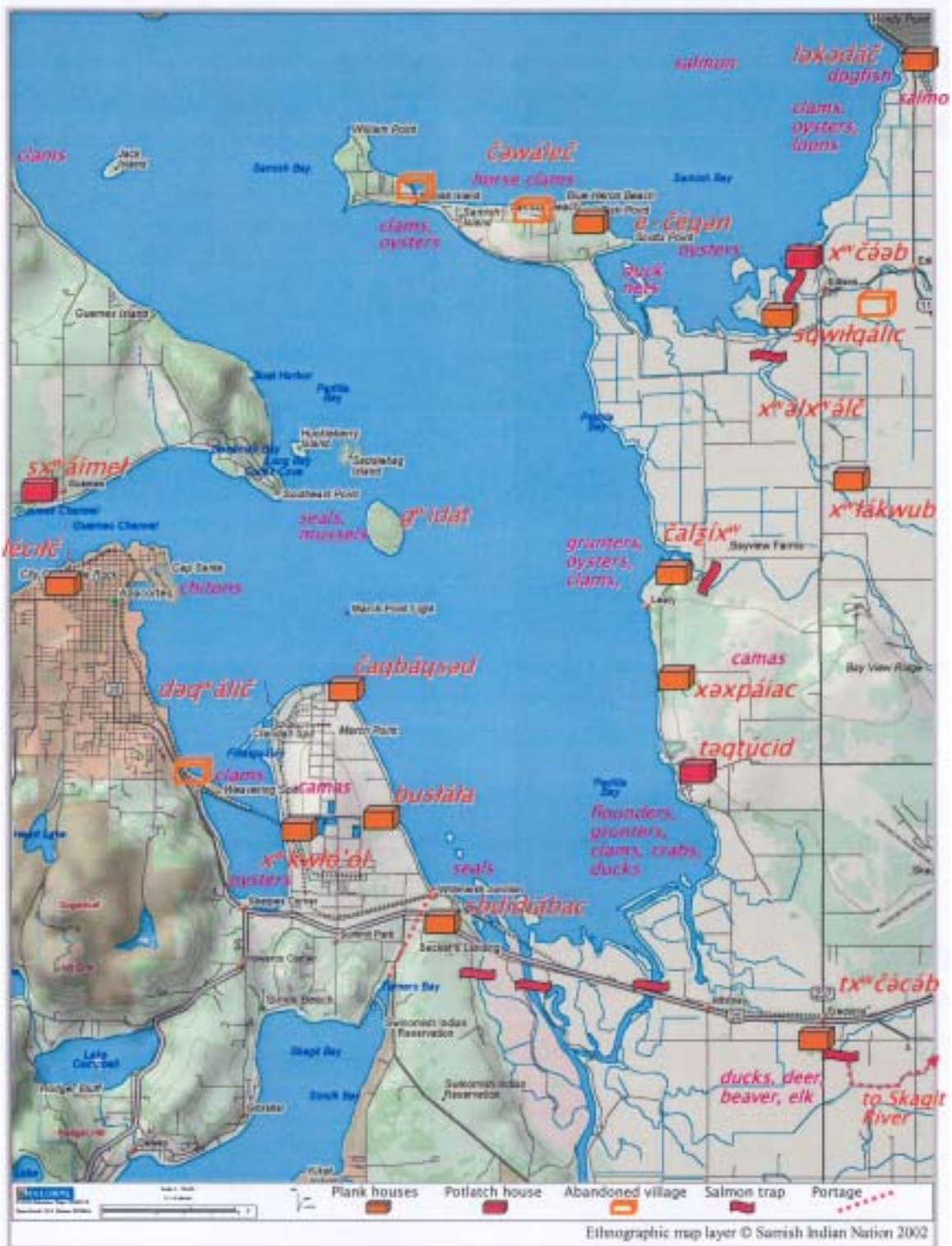
During late historic times, the study area and vicinity was occupied by two Coast Salish Lushootseed-speaking groups. The Swinomish territory encompassed the northern part of Whidbey Island, portions of Fidalgo Island, all of the islands in Similk Bay and northern Skagit Bay, and Smith and Hat Islands. Samish territory included Samish, Guemes, and Cypress Islands, the northwest portion of Fidalgo Island, and the lands adjacent to Samish Bay (City of Anacortes 2000).

The following three archeological sites within and adjacent to the site are recorded with the Washington State Office of Archeological and Historic Preservation:

- A. A 80 X 30-yard, 2 to 3-foot thick shell midden near Weaverling Spit. Diking, erosion and a landfill destroyed this site.
- B. A 75 X 33-yard, 5-foot deep shell midden near Weaverling spit.
- C. A 80 X 15-yard, 3-foot thick shell midden along the eastern shore of the site. Fire modified rock, shell and occasional flaked stone implements were found in the intertidal zone.

An additional site, the Samish Indian Nation has recently identified a cemetery on the northwest corner of Weaverling spit. At this point it is thought to be a tribal burial area. The Tribe is planning further investigation of the site.

Tribal names are identified for several areas within and adjacent to the proposed reserve site (figure 5). A winter village was recorded on the east shore of Fidalgo Bay (Kwalo'l). Fidalgo Bay was known as Dugwa'tc, meaning "protected place where there is calm water."



E. Habitats and features represented within the site

1. Is the site a good example (relatively undisturbed) of representative habitat as compared with the overall reserve program goal?
 - Does the proposed site capture species or habitats that are much less common within the biogeographic region than they were historically?

Populations of groundfish and marine birds have declined substantially. Stocks of spiny dogfish, Pacific cod, lingcod, sablefish, surfperch, and Dover sole are currently below their long-term averages in North Puget Sound (PSWQAT 2002). Mudflats and shallow embayments are considered important habitats for flatfish and are particularly important as nursery grounds (Antrim et al. 2003). Populations of many marine birds have declined substantially between 1978 and 1999 in North Puget Sound (table 3).

Table 3: Change in North Puget Sound marine bird densities between 1978 and 1999 (PSWQAT 2002)

Species	Change (1978 vs 1999)	
Marbled Murrelet	-96%	Decreasing Densities
Western Grebe	-95%	
Long-tailed Duck	-91%	
Red-necked Grebe	-89%	
Horned Grebe	-82%	
Total Loon Densities (3 sp.)	-79%	
Scaup	-72%	
Black Brant	-66%	
Common Loon	-64%	
Double-crested cormorant	-62%	
Scoter sp.	-57%	
Pigeon Guillemot	-55%	
Gull Densities	-43%	
Goldeneye	-23%	
Bufflehead	20%	Increasing Densities
Merganser	55%	
Harlequin Duck	189%	

Over the past twenty-five years the spawning biomass observed for Fidalgo Bay stock has either remained stable or grown slightly (figure 6). This is in contrast to other stocks in North Puget Sound where spawning biomass has declined from 10,613 tons in 1980 to just 3992 tons in 2002 – a 62% decline. Despite declines in North Puget Sound, increasing populations in stocks in South Puget Sound have offset this trend when all Washington Stocks are aggregated as spawning biomass between 1977 and 2002 is little changed at 18,248 tons and 18,312 tons respectively.

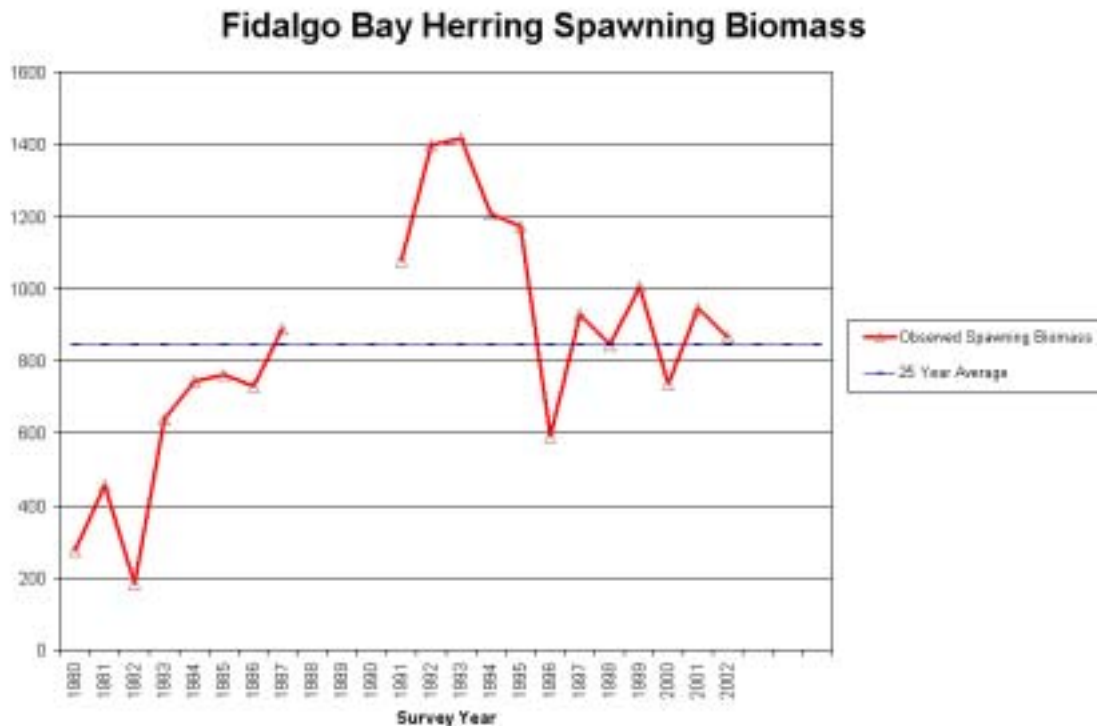


Figure 6: Fidalgo Bay herring spawning biomass (Stick, personal communication; Lemberg et al. 1997).

2. Does the site include habitat types that are under-represented in the aquatic reserves program or marine protected area network?
 - Does the site contain representative habitats not otherwise protected in the network of protected areas or aquatic reserves?

At present no reserves include significant portions of any herring spawning, however two other Aquatic Reserve proposals in the north Puget Sound – Cherry Point and Fidalgo Bay – do include significant portions of herring spawning stocks. Protection of this stock would help conserve a feeding area that is used extensively by a wide variety of migratory birds that winter in Puget Sound. The proposed site includes the majority of a major shallow water bay in North Puget Sound. The only other major bay in this region that is currently managed primarily for conservation is Padilla Bay National Estuarine Research Reserve. Additionally, broad intertidal mud-flats of the kind found in the southern portion of the reserve are the type that have commonly been dredged and filled for industrial development or agriculture elsewhere in the region (Penttila, personal communication). An example of the development pressure historically exerted on expansive tidelands can be taken from the fact that Fidalgo Bay was once studied to determine its suitability for being developed as an industrial park (Marshall, Barr and Associates 1964).

3. Does the site include a biogeographical location that is under-represented in the aquatic reserves program or marine protected area network?
 - Is the site located in a biogeographic region or sub-region that is underrepresented in the existing reserve network?

Including all Aquatic Reserves presently under review only 2.9% of Puget Sound is protected in Marine Protected Areas recognized by the Federal MPA Center (DNR, unpublished data). Two additional areas within the sub-region, Fidalgo Bay and Cypress, are being reviewed for Aquatic Reserve status. The largest existing MPA in the region is the 11,000 acre Padilla Bay National Estuarine Research Reserve. Many of the other protected areas in these regions are either: a) extensions of upland protected areas and provide limited protection to marine waters or b) close harvest for a small number of species.

F. Viability of the occurrences of interest

1. Site features meet the intent of the reserve
 - Are species, habitats or ecosystem processes consistently associated with reserve site?

Since this herring stock was first recognized in 1974 (Penttila, personal communication), herring have been observed to consistently spawn in Fidalgo Bay and surrounding areas. The overall environmental condition of Fidalgo Bay may be recovering from industrial activity that was historically found on the western shoreline of the bay. This activity was focused on forestry products and used parts of the bay for log storage.

2. Number of conservation targets
(*SEE "Special value for biodiversity or species diversity"*)
3. Number of ecological processes
 - Does the site contain unique or distinctive physical habitat features (e.g., oceanographic gyre, oceanographic sill, natural beach spit, etc)?

The Fidalgo Bay site is adjacent to three significant natural shoreline features including Crandall Spit, Weaverling Spit, and Little Crandall Spit. Crandall spit is a large meandering spit with a salt marsh in the backshore. While the backshore marsh has been manipulated to facilitate drainage and for an oil pipeline that traverses the shoreward portion of the spit, the salt marsh appears to remain in relatively good condition. This spit provides critical habitat for a wide variety of birds that winter in Fidalgo Bay and is suitable spawning substrate for surf smelt. Natural, unprotected accretion spits like Crandall and Little Crandall Spits are uncommon in Puget Sound.

- Does the site contain unique or distinctive biological processes (larval rearing zooplankton concentrations, aggregation sites, etc.)?

Penttila (1995) suggests that the bay may concentrate larvae and observes that larval densities are significantly higher in southern Fidalgo Bay than in northern Fidalgo Bay where stronger currents probably distribute larvae more widely.

G. Defensibility of the site

1. Complementary protection within a reserve or protected area network.
(*See: Habitat types that are under-represented in the aquatic reserves program or marine protected area network*)
 2. Connectivity to a reserve or protected area network and/or for species and/or habitats
 - Is site adjacent to existing marine or freshwater protected areas administered for conservation or restoration purposes?
- Skagit Land Trust acquired the area south of the railroad trestle in 2000. Ownership of this area was transferred to WDNR with the contingency that the site is management solely for preservation of habitat for fish and wildlife uses and limited human uses. Maintenance of this natural habitat is consistent with the City's plans for a pedestrian trail across the railroad trestle bridge.
 - The reserve is physically separated from the Padilla Bay Sanctuary by March Point and the adjacent western shoreline that contains the navigation channel to the entrance of the Swinomish Channel. However, the reserve is connected by water to the Padilla Bay National Estuarine Research Reserve.
 - The Hat Island Natural Resource Conservation Area (U.S. Fish and Wildlife) is located in Padilla Bay about 1 mile northeast of Fidalgo Bay.

- Does the site provide regional habitat connectivity through any of the following functions? Refuge (predator, physiological, high energy), food production, migratory, corridors, spawning, nursery or rearing, riparian vegetation, adult habitat, other functions.

Armstrong et al. (1986) found that ovigerous (egg bearing) female Dungeness crabs are very abundant common in Ship Harbor (Guemes Channel) just west of Fidalgo Bay. Young-of-the-year Dungeness crabs use vegetated portions of Fidalgo Bay as rearing habitat before moving to deeper waters. One of the most important perceived values of shallow water habitats like Fidalgo Bay is as a nursery area and migration pathway for juvenile salmonids. While no studies have directly assessed salmonid use of Fidalgo Bay, it is assumed based on regional studies that salmon will be present during the major spring outmigrations from the Skagit and Samish rivers (City of Anacortes 2000). Peak abundances would be expected between April and June with smaller abundances present throughout the year.

Eelgrass beds have been widely reported as nursery areas for a wide-variety of species. Portions of Fidalgo Bay at the appropriate tidal elevations are densely covered with native eelgrass (*Z. marina*).

Marine birds visiting Fidalgo Bay use Crandall Spit, an undeveloped sand spit, as an area to rest (Davison, personal communication).

3. Appropriate size to be sustainable

- Is area large enough to be self-sustaining?

It is unlikely that the area is large enough to persist in isolation, however the site is in the vicinity of another substantial protected area (Padilla Bay). Most species using the bay use it for either a period of their life (e.g., spawning and rearing) or seasonally.

4. Ability to persist over time

- Can site be successfully managed to maintain the features of interest?

The ecological condition of the area appears to be either relatively stable or improving. Therefore it appears likely that the site will be capable of persisting assuming regional ecological processes do not deteriorate.

- Are there known anthropogenic or natural threats to the continued viability of the site?

The site continues to be threatened by the risk of oil spills, and ongoing damage resulting from existing nearshore alterations (filling, dredging and shoreline hardening). For further discussion of these threats and mitigation measures being undertaken see “Risks to the ecosystem or feature of interest.”

5. Known or anticipated activities that endanger the site or habitat

- Are proposed land uses or modifications compatible with reserve designation? (Modifications of interest are described in Appendix A)?

The Revised Final Integrated Fidalgo Bay-Wide Plan & EIS (City of Anacortes 2000) identified four active development proposals that may affect the reserve: Brent Homes, Shipyard Site – plans for a 50-acre site to include a shipyard and industrial re-development, including a proposed access channel; Andrews/Gillespie/Jermyn – plans for the construction of residential units and docks on a 3-acre site that would require in-water work and dredging; Fidalgo Bay Resort – a proposed 18-acre marina; Public Project – pedestrian and possible scenic rail line along south shoreline of Fidalgo Bay and across trestle (City of Anacortes 2000). Of these the Brent Homes, Shipyard site is mostly to the north of the proposed reserve site and the other projects are proposed on private uplands and tidelands adjacent to the reserve. While no development proposals currently exist for the refineries along the eastern shore of the bay, it is likely that upgrades will continue to occur at these facilities. Additionally, roads are immediately adjacent to most of the reserve site and management associated with roads including brush clearing is negatively affecting the reserve by preventing the development of riparian corridors. Additionally, much of the shoreline hardening adjacent to the reserve is associated with roads.

6. Potential for factors contributing directly to the area’s decline to be prevented

- Would reserve status provide protection for habitats, species or processes of interest from encroachment?

Fidalgo Bay continues to be an area of interest for a wide range of development proposals. Its proximity to Anacortes makes it appealing for residential, commercial and industrial uses. Antrim et al. (2003) state that “any opportunity to preserve intertidal habitat through the acquisition of land would be a high priority. For example, acquisition

of privately owned parcels within the recent state aquatic reserve and incorporation of these tidelands into a preserve is a high priority. Moreover, gaining a permanent status for the aquatic reserve area north of the railroad trestle was also recognized as an important habitat protection opportunity.”

H. Manageability of the site

1. Coordination with other entities, including local jurisdictions and current leaseholders
 - Has another entity previously identified this site or areas within the site as a priority for protection? (*Examples include Important Bird Areas (Cullinan 2001), priority areas for Research Natural Area Designation (Dyrness et al. 1975), or priority areas for conservation (e.g., through ecoregional planning, Natural Heritage Program research (Kunze 1984), or similar process (Dethier 1989)*)

Fidalgo Bay has not been identified by Dyrness (1975), Long et al. (1983), Kunze (1984), Dethier (1989) or Cullinan (2001). The site is included in recent ecoregional planning efforts undertaken by The Nature Conservancy. The conservation importance of Fidalgo Bay has continued to grow due to relatively recent (1974) discovery of and increasing importance of the herring stock that use the area and the considerable value of the area to the recently delineated population of Pacific High Arctic Brandt.

Conservation planning and funding proposals related to Southern Fidalgo Bay note the importance of the local herring spawning stock, significant high quality eelgrass beds, juvenile Dungeness crab habitat, use of the bay as feeding habitat for bald eagles and herons, use of the area by migratory waterfowl and the importance of the area for scenic, recreational and educational values.

2. Potential cooperative partners for management, monitoring, or enforcement
 - Have potential cooperative management partners been identified? ¹
 - **City of Anacortes** – Recognized the need to coordinate the update (2004) of their shoreline master program (SMP) with the management plan developed for the reserve. Willing to build consistency between SMP and the aquatic reserves management plan into local land management planning
 - **Samish Tribal Nation** – Planning purchase of the Fidalgo Bay RV Resort on Weaverling spit. Their plans are to restore baitfish spawning habitat in adjacent intertidal areas.
 - **The Texaco Oil Spills Natural Resource Trustees** - The preferred compensatory restoration alternative identified in the draft plan involves the acquisition of selected available properties within the bay that are necessary to support forage

¹ This criterion is intended to gauge the amount of planning and effort that has already been invested in the development of a protection plan for the area of interest. These criteria represent best management principles that the Aquatic Reserve program will seek to employ, and will be used to give preference to proposals that are in more advanced stages of development.

- fish spawning. These properties consist of all of the privately owned tidelands adjacent to the northern section of the aquatic reserve (above and adjacent to the trestle).
- **Other Tribes with U&A rights within the aquatic reserve** – The tribes are committed to preserving and enhancing all fish, crab and shellfish habitat in the reserve to ensure Tribal ceremonial, subsistence and commercial needs. Presently, only the Swinomish Tribe has committed to involvement in developing the management plan for this site.
 - **Skagit Land Trust** - Ownership of the entire area south of the trestle was transferred to WDNR with the contingency that the site is management solely for preservation of habitat for fish and wildlife uses and limited human uses. This area cannot be utilized for any other purposes.
3. Adjacent natural areas or public lands
 - Is site adjacent to terrestrial protected areas managed for conservation or restoration purposes?
 - City of Anacortes The city owns the railroad trestle that crosses the aquatic reserve, and plans to develop a pedestrian trail from downtown and across the railroad trestle bridge. Additionally, there are plans to develop a small gauge railway to use the same right-of-way.
 - Skagit Land Trust acquired the area south of the railroad trestle in 2000. Ownership of this area was transferred to WDNR with the contingency that the site is management solely for preservation of habitat for fish and wildlife uses and limited human uses. Maintenance of this natural habitat is consistent with the City's plans for a pedestrian trail across the railroad trestle bridge.
 - The reserve is physically separated from the Padilla Bay Sanctuary by March Point and the adjacent western shoreline that contains the navigation channel to the entrance of the Swinomish Channel. However, the reserve is connected by water to the Padilla Bay National Estuarine Research Reserve.
 - The Hat Island Natural Resource Conservation Area (U.S. Fish and Wildlife) is located in Padilla Bay about 1 mile northeast of Fidalgo Bay.
 4. Provide a description of how to measure success (i.e., monitoring).
 - See 'Kinds of monitoring needed'
 5. Describe kinds of monitoring needed
 - Does reserve proposal include a monitoring plan that measures reserve progress towards goals and provides for adaptive management?²

² This criterion is intended to gauge the amount of planning and effort that has already been invested in the development of a protection plan for the area of interest. These criteria represent best management principles that the Aquatic Reserve program will seek to employ, and will be used to give preference to proposals that are in more advanced stages of development.

A management plan has not yet been developed for the entire reserve. A management plan has been developed for the portion of the reserve that has a conservation easement held by the Skagit Land Trust. The easement conveys certain rights to the Skagit Land Trust including the right to identify, preserve and protect the property into perpetuity, right for Skagit Land Trust to enter the site annually for monitoring and additionally to examine potential violations, and the right to enjoin any activity on, or use of the protected property that is inconsistent with the site easement. Prohibited uses include: subdivision; construction; any activity that causes erosion or water pollution; any draining, filling, dredging, ditching or diking of tidelands; alteration of naturally occurring habitats; application of agricultural chemicals; waste disposal; construction of roads, trails, paths or waterways; commercial signs; hunting; mining; wildlife disruption; commercial aquaculture; or use of the property for mitigation banking or credits. This management plan includes annual monitoring by the Land Trust that includes written and photo descriptions of the site from fixed locations.

Washington DNR (1996) inventoried intertidal and subtidal habitats in the bay for aquatic vegetation providing an important baseline for future comparisons. Additionally, Washington Department of Ecology has taken aerial photographs of shorelines surrounding the bay in 1977, 1994 and 2001. Additionally, the Skagit County MRC did a shoreline inventory along the eastern shore of the reserve site in 2001. Padilla Bay National Estuarine Research Reserve has actively undertaken research and monitoring within Padilla Bay just to the east of the proposed site.

6. Kinds of enforcement needed to make sure incompatible uses and impacts do not encroach on reserve.
 - What kind of enforcement is needed to prevent incompatible uses and impacts from encroaching on the reserve?

At present enforcement is primarily the responsibility of the Skagit Land Trust who monitors the site and has the right to intervene if it observes activities that undermine the conservation easement established on the property. Monitoring along the western and southern shores of the site are also the responsibility of the City of Anacortes while Skagit County is responsible for the unincorporated portions of the site along the eastern shoreline. Additionally, “it is unlawful to fish for or possess crab taken for personal use from the waters of Fidalgo Bay within 25 yards of the Burlington Northern Railroad trestle connecting March Point and Anacortes” (WAC 220-56-315). Enforcement of this regulation as well as other general regulations regarding fisheries are the responsibility of WDFW and tribes with fishing rights.

I. Does the site serve or conflict with the greatest public benefit?

- Does reserve status represent the greatest public benefit?

This site appears to have few, if any conflicting uses. There are presently no reasonable development proposals for the site. The entire southern portion of the site is in permanent conservation easement. The Texaco Oil Spills Trustees have identified all the private intertidal areas adjacent to the northern portion of the site as priority for purchase, habitat restoration and inclusion into the proposed reserve. Refinery operations upland of the eastern shoreline of Fidalgo Bay currently use piers that are outside of the proposed reserve area to load and unload hydrocarbon products. A pipeline runs along the intertidal in the northern portion of the bay. The impacts of this pipeline to the intertidal have not been studied, and are expected to be limited during normal operations.

- Is reserve status compatible with existing or proposed adjacent uses?

The City of Anacortes has suggested that adjacent upland zoning be changed to compliment the proposed site when they update the City's shoreline master program. The refineries have not raised any issues about the site.

The Samish Tribe is in the process of purchasing the Weaverling Spit RV park. Their intention is to restore and keep in conservation the intertidal areas of the Park.

- Assess the direct use, indirect use, option, and non-use values associated with the site.

All uses currently associated with the proposed site are presently directed toward conservation and expansion of protected areas into the areas adjacent to the proposed site. Use of shorelines in the vicinity of the refineries has been restricted recently in response to concerns raised by the Department of Homeland Security.

The site includes entire Fidalgo Waterway and the extreme southern portion of the Anacortes Harbor Area (figure 7). Procedures exist to propose modifications or to remove these areas from waterway or harbor area status. State waterways are not less than fifty nor more than one thousand feet wide, beginning at the outer harbor line and extending inland across the tidelands or shorelands belonging to the state. They are reserved from sale or lease and serve as public highways for watercraft, providing navigational access to the public from upland areas and platted streets. WAC 332-30-106 (74) defines 'Waterway' as "an area platted across aquatic lands or created by a waterway district providing for access between the uplands and open water, or between navigable bodies of water."

Harbor Areas are a means of protecting the public interest by insuring public ownership and control of state-owned aquatic lands in front of and near the commercially important waterfronts of cities. Harbor Areas are administered by the Washington Department of Natural Resources, and established and amended by the State Harbor Line Commission. Article XV of the Washington State Constitution requires that Harbor Areas shall be forever reserved for landings, wharves, streets, and other conveniences of navigation and commerce. Leases may be granted up to 30 years in Harbor Areas and up to 55 years on first-class tidelands and bedlands. Harbor Area uses are ranked in order of their need for waterfront locations (WAC 332-30-115). Residential uses, including apartments, condominiums, houseboats, single and multi-family housing, motels, boatels and hotels, are prohibited in Harbor Areas.

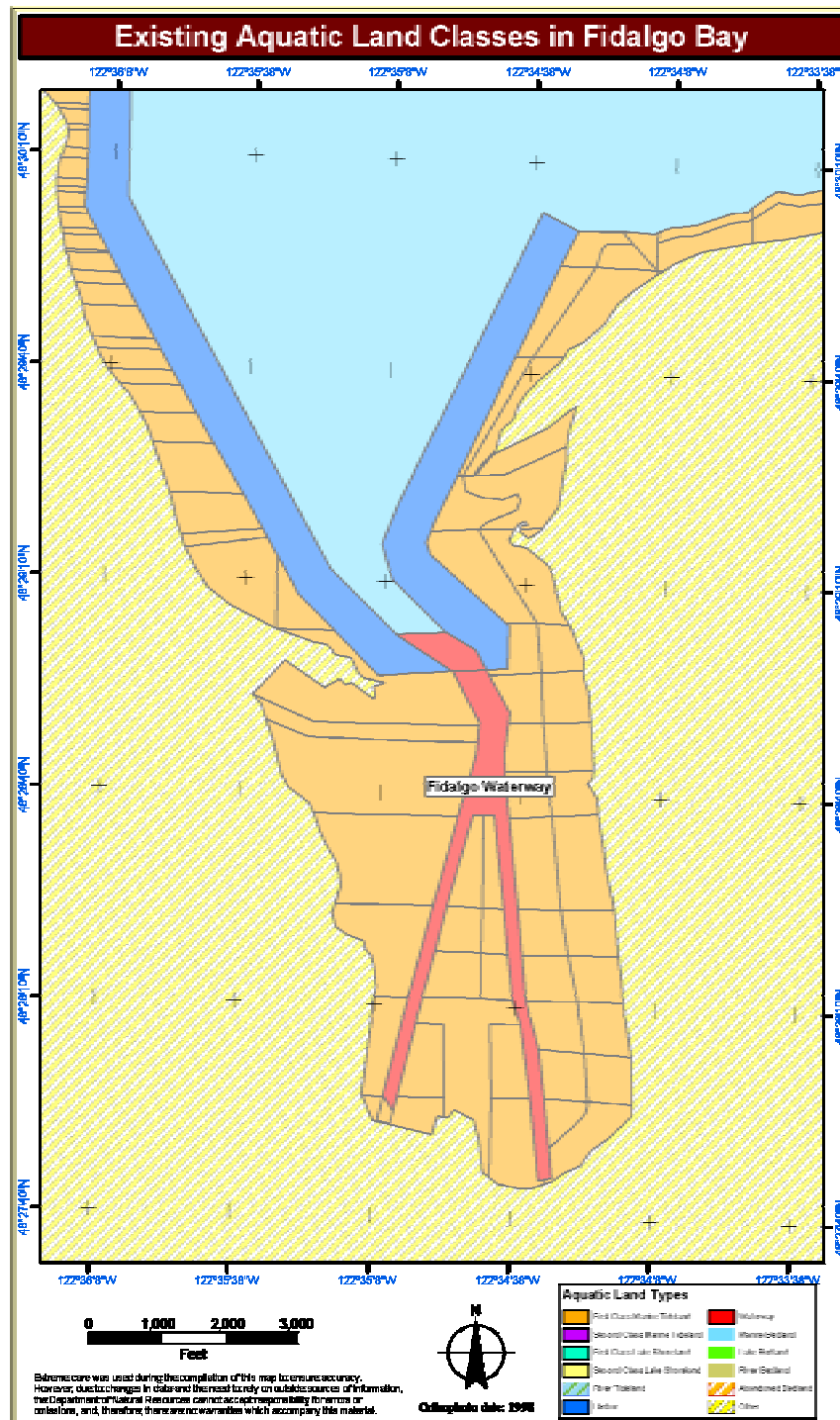


Figure 7: Existing aquatic land classes in Fidalgo Bay.

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